DOCUMENTS & TRANSLATIONS

SAINT THOMAS AQUINAS: "ON THE COMBINING OF THE ELEMENTS"

*Translated by Vincent R. Larkin**

Scholars agree that the *De mixtione elementorum,* which is here translated, is an authentic work of St. Thomas Aquinas.[1] This work is a letter addressed to a Master Philip, about whom there is no definite information. According to Mandonnet, the letter was composed about 1273.[2] But Eschmann places the time of composition at 1270/1.[3]

The *opusculum* is found in the following editions of Thomas' works:

Opera omnia (Rome, 1570/1), XVII, 212	Piana edition
Opera omnia (Parma, 1852/73), XVI, 353 (New York reprint, 1948)	Parma edition
Opera omnia (Paris, 1889), XXVII, 502	Vives edition
Opuscula omnia (Paris, 1927), I, 21	ed. Mandonnet
Opuscula omnia (Paris, 1949), I, 19	ed. Perrier
Opuscula philosophica (Turin, 1954), p. 155	Marietti edition

This translation has been made from the Marietti text edited by R. M. Spiazzi, O.P.

The *De mixtione elementorum* takes up the problem of Aristotle's *De generatione et corruptione,* Book I, chapter 10. Alexander of Aphrodisias' *De mixtione* was also inspired by this text of Aristotle. Albertus Magnus commented on the same text in his *De mixtione* which is Treatise VI of the first book of his *De generatione et corruptione.* Thomas' authentic commentary on the *De generatione et corruptione* does not extend beyond the seventeenth *lectio* of the first book.[4] *Lectiones* 24 and 25 of Book I consist of Albertus Magnus' entire treatise *De mixtione* with the exception of his chapters V and VI, in place of which was inserted Thomas' *De mixtione elementorum* almost verbatim. It is found in *lectio* 24.[5]

In this work Thomas considers two viewpoints on the question of how the forms of the elements remain in compounds. The first position he takes up is

* Immaculate Heart College, Los Angeles. The references to the *Summa theologiae* in these notes are to the Ottawa edition of 1941; those to the *Summa contra gentiles* are to *Editio leonina manualis,* Rome 1934. The Aristotelian references are to the Greek text, *Aristotelis opera,* ed. Immanuel Bekker, Berlin, 1831.

[1] Cf. P. Mandonnet, o.p., *Des écrits authentiques de St. Thomas d'Aquin,* 2nd ed. (Fribourg, 1910), n. 16, p. 104; M. Grabmann, *Die Werke des hl. Thomas von Aquin* in *Beiträge zur Geschichte der Philosophie und Theologie des Mittelalters,* Band XXII, Heft 1/2 (Münster i. W., 1949), p. 346.

[2] Cf. P. Mandonnet, o.p. and J. Destrez, o.p., *Bibliographie Thomiste* (*Bibliothèque Thomiste,* I), Le Saulchoir, Kain, 1921, n. 16, p. xiii.

[3] Cf. I. T. Eschmann, o.p., "A Catalogue of St. Thomas's Works" in E. Gilson, *The Christian Philosophy of St. Thomas Aquinas* (New York, 1956), p. 420.

[4] Cf. *In libros Aristotelis de generatione et corruptione* in *Opera omnia* (Rome, 1886), vol. III, p. xxi; vol. XIII, note 1, p. xxiii.

[5] Cf. *In libros Aristotelis de generatione et corruptione continuatio per ignotum auctorem* in *Opera omnia,* vol. III, Appendix, p. xx.

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that these forms persist actually in the compound. After refuting it, he presents an opinion that tries to avoid the difficulties inherent in the preceding position and those also that are entailed in the contention that the forms of the elements do not exist in the compound at all. Thomas rejects this second opinion also and then reaffirms the Aristotelian solution. A perceptive analysis of the solution which Thomas offers in the *De mixtione elementorum* is to be found in the work of Anneliese Maier, *An der Grenze von Scholastik und Naturwissenschaft* (Rome, 1952), pp. 31-35.

I have numbered the paragraphs for convenient reference.

ON THE COMBINING OF THE ELEMENTS

1. Many men are in doubt as to the manner of existence of elements in a compound.

2. Some think that the substantial forms of the elements remain, while the active and passive qualities of the elements are somehow placed, by being altered, in an intermediary state;[6] for if they did not remain, there would seem to be a kind of corruption of the elements, and not a combination.

3. Again, if the substantial form of the compound is the act[7] of matter,

[6] Thomas here refers to Avicenna, as is made clear in *Summa theologiae,* vol. I, Pars I, q. 76, art. 4, ad 4, p. 456b. He may also have his master, Albertus Magnus, in mind, for Albert indicates in his *De causis et proprietatibus elementorum* that he adheres to the doctrine of the plurality of forms in compounds: Docebimus accidentales quae aliquando elementorum inducunt corruptionem, ita quod non a specie corrumpuntur, sed corrumpuntur eorum qualitates. (*Opera omnia,* vol. IX, ed. Borgnet, Lib. I, tract. I, c. 1 [Paris, 1890], p. 585). The pseudo-Aristotelian work on astronomy and geology on which Albert commented, the Arabic original of which is lost, is quoted by Thomas in *Commentum in quatuor libros sententiarum,* dist. XLIV, quaest. III, art. 1, quaestiuncula III, solutio III, ad 3: Secundum Philosophum in lib. *de proprietatibus elementorum* (cap. 1), nullum animal in igne vivere potest. (*Opera omnia,* t. VII, vol. II [N.Y. 1948], p. 1102). Examination of this work, *De causis proprietatum elementorum libellus, Aristoteli ascriptus,* reveals no influence on Thomas' *De mixtione elementorum.* (*Aristotelis opera omnia cum Averrois commentariis* [Venetiis 1560], t. VI, fol. 279v–286v). Albert discusses alteration of qualities in *De generatione et corruptione,* lib. II, tract. II, c. XV: Quae miscentur, non in toto destruuntur, secundum intensiones suarum qualitatum ad invicem corrumpuntur, et non ipsae qualitates in toto . . . (*Opera omnia,* vol. IV, p. 441). Anneliese Maier treats of mediaeval views of the intension and remission of qualities in her *Zwei Grundprobleme der scholastischen Naturphilosophie* (Rome, 1951). For a discussion of Albert's handling of the problem, *vide* pp. 18-20. For Thomas' opinion, *vide* pp. 23-28.

[7] In Thomas' terminology, *act* indicates perfection of one kind or another. It is, strictly speaking, indefinable. It is an ultimate, irreducible datum. Hence, rather than define it, Aristotle gave many examples of what he meant by *act.* Act is always associated with potency in finite beings which stand between God as pure act and matter as pure potency. Act is of itself unlimited but potency, as capacity for perfection, serves as the principle of limitation. Act and potency are not so much analytical tools of the understanding as they are constitutive principles in the real order. As co-extensive metaphysical principles, they are realized differently in different orders. In the order of being, existence plays the role of act while its correlative, essence, exemplifies potency. In the order of becoming, form is act and matter is potency. Form and matter together constitute essence. Form is the principle of specification and matter is the principle of individuation. Form is determining; matter is determinable. Form actuates matter. Through form *esse,* the act of being, is communicated to matter, which as pure potency has no actuality of itself. Finally in the order of activity, accident is act and substance is potency. The attributes or modifications of substance perfect it and hence are also spoken of as act. Thus act is an analogical concept, embracing in its imperfect unity both sameness and difference.

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without presupposing the forms of the simple bodies, then the simple bodies would lose the nature of elements; for an element is that out of which something is in the first instance formed, and which remains in it, and is by its nature indivisible;[8] for if the substantial forms are withdrawn, the compound will not be formed from the elements in such a way that they remain in it. Now this cannot be the case; for it is impossible for the same portion of matter to receive the forms of the different elements. If then the substantial forms of the elements are preserved in the compound, they must be in different parts of matter. But it is impossible for different parts of matter to receive them, unless we assume that quantity is present in matter; for if quantity is not presupposed, the substance would still be indivisible, as is made clear in the first book of the *Physics*.[9] Now a physical body is composed of matter that is subject to dimensions and of a substantial form united to it. Therefore the different parts of the matter that support the forms of the elements receive the natures of several bodies. Now it is impossible for many bodies to be [in a compound] at the same time. The four elements[10] will not then be in each part of the mixture, and hence there will not be a true mixture, but only an apparent one,[11] as is the case when bodies, which are invisible or imperceptible due to their minuteness, are clustered together.

4. Furthermore, every substantial form demands a special disposition in matter, without which it cannot exist; as a result, alteration precedes generation and corruption. Now it is impossible that the special disposition which is demanded by the form of fire and which is demanded by the form of water should be found in the same [portion of matter], because it is on account of such dispositions that fire and water are contraries. It is indeed impossible for contraries to be entirely present in the same thing at the same time. Therefore it is impossible for the substantial forms of fire and water to be in the same

[8] Cf. Aristotle, *Metaphysics,* vol. II, lib. V, c. 4, 1014b 25. Also Aquinas, *In libros Aristotelis de caelo et mundo expositio,* lib. III, lect. VIII: Elementum aliorum corporum est, in quod alia corpora dividuntur seu resolvuntur. Non enim quaelibet causa potest dici elementum, sed solum illa quae intrat rei compositionem. (*Opera omnia,* vol. III, Rome 1886, p. 256). Cf. Aquinas, *Commentarium in XII libros Metaphysicorum Aristotelis,* lib. V, lect. IV (Turin, 1935), par. 800, p. 263: Illa enim dicuntur corporum esse elementa, in quae ultimo resolvuntur omnia corpora mixta: et per consequens ea sunt, ex quibus primo componuntur huiusmodi corpora.

[9] Aristotle, *Physics,* vol. 1, lib. I, c. 2, 185b 16; c. 7, 189b 30–191a 22.

[10] Aristotle, *De caelo,* vol. I, lib. III, c. 3, 4, 5, 302a 10–304b 22. Also lib. IV, c. 5, 312a 22. *De generatione et corruptione,* vol. I, lib. II, c. 2, 3, 4, 5, 329b 7–333a 15. Cf. Pliny, *Naturalis Historia,* lib. II, c. IV (5): Nec de elementis video dubitari quattuor esse ea. (*Pline l'Ancien, Histoire Naturelle,* ed. Jean Beaujeu [Paris 1950], vol. II, pp. 10, 11).

[11] Thomas in *Contra gentiles,* lib. IV, c. 35, pp. 488, 489 distinguishes the unity that results from *compositio* from that which results from *mixtio*. *Compositio* corresponds to Aristotle's *synthesis* (a juxtaposition of things that are not reciprocally active and passive). In *Sum. theol.,* vol. I, pars I, q. 76, art. 4, ad 4, pp. 456b, 457a, Thomas again distinguishes *mixtio vera* from *mixtio ad sensum*. By *mixtio vera* Thomas understands a blending of natures. *Mixtio vera* corresponds to Aristotle's *mixis* or *krasis*. We have *mixtio ad sensum* when particles appear to combine but retain their natures. *Mixtio ad sensum* corresponds to *mixis* or *krasis* in the Stoic sense. (*Mixis* is a blending of solids and *krasis* is a blending of liquids.) In *Contra gentiles* II, 56 Thomas speaks of *mixtio ad sensum* as *confusio*. For the Stoics union of confusion differs from union of mixture, for union of confusion *(sygchysis)* results in a *tertium quid*. Thomas does not observe the Stoic sense of these terms. For a comparison of the teachings of Aristotle and the Stoics on mixtures, *vide:* Harry Austryn Wolfson, *The Philosophy of the Church Fathers,* vol. I (Cambridge, Mass., 1956), pp. 381-385.

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part of a compound. If then a compound is formed while the substantial forms of the elements remain, it follows that it is not a true compound, but only an apparent one, as when parts, indiscernible because of their smallness, are placed next to one another.[12]

5. Some men,[13] wishing to escape both arguments, have fallen into a greater difficulty.

6. For, in order to distinguish the combinations of elements from their corruption, they said that the substantial forms of the elements indeed remain somehow in the compound; but, lest they should be forced to admit that this is an apparent combination, and not a true one, they maintained that the forms of the elements do not remain in the compound in their entirety, but are reduced to some intermediary state; for they say that the forms of the elements admit of more or less, and are related to one another as contraries. But because this plainly contradicts the common opinion of men and the words of the Philosopher who says in the *Praedicamenta*[14] that substance has no contrary and that it does not admit of more or less, they go further, and say that the forms of the elements are the least perfect of all, inasmuch as they are nearer than others to prime matter; hence they stand midway between substantial and accidental forms; and thus, inasmuch as they approximate the nature of

[12] Aristotle, *De sensu,* vol. I, c. 3, 440a 31.

[13] *Sum. theol.,* vol. I, pars. I, q. 76, art. 4, ad 4, p. 457a indicates that Thomas has Averroes primarily in mind here. It serves to illumine the foregoing argumentation: Dicendum quod Avicenna posuit formas substantiales elementorum integras remanere in mixto, mixtionem autem fieri secundum quod contrariae qualitates elementorum reducuntur ad medium. Sed hoc est impossibile. Quia diversae formae elementorum non possunt esse nisi in diversis partibus materiae; ad quarum diversitatem oportet intelligi dimensiones, sine quibus materiae divisibilis esse non potest. Materia autem dimensioni subiecta non invenitur nisi in corpore. Diversa autem corpora non possunt esse in eodem loco. Unde sequitur quod elementa sint in mixto distincta secundum situm. Et ita non erit vera mixtio, quae est secundum totum; sed mixtio ad sensum, quae est secundum minima iuxta se posita. – Averroes autem posuit in III *De caelo,* quod formae elementorum propter sui imperfectionem sunt mediae inter formas accidentales et substantiales; et ideo recipiunt magis et minus; et ideo remittuntur in mixtione et ad medium reducuntur, et conflatur ex eis una forma. Sed hoc est etiam magis impossible. Nam esse substantiale cuiuslibet rei in indivisibili consistit; et omnis additio et subtractio variat speciem, sicut in numeris, ut dicitur in VIII *Metaph.* Unde impossibile est quod forma substantialis quaecumque recipiat magis et minus. Nec minus est impossibile aliquid esse medium inter substantiam et accidens. Aquinas, *Quaestiones quodlibetales,* vol. V, Quodl. I, q. 4, art. 6, ad 3 (Turin, 1942), pp. 6, 7: Dicendum, quod Avicenna posuit formas elementorum actu remanere in mixto; quod non potest esse, quia formae elementorum non possunt esse in una parte materiae simul; et sic oportet quod sint in diversis materiae partibus, quae distinguuntur secundum dimensivae quantitatis divisionem: et sic oportebit quod vel plura corpora sint simul, vel quod non sit mixtio vera totius ad totum, sed mixtio ad sensum, secundum minima juxta se posita. Averroes autem in III *De caelo* dicit, quod formae elementorum sunt mediae inter formas accidentales et substantiales, quod recipiunt magis et minus; et sic formis elementorum remissis, et quodam modo ad medium redactis, quodammodo fit mixtio. Sed hoc est minus possibile quam primum: nam forma substantialis est terminus quidam esse specifici, unde in indivisibili est ratio formae sicut ratio numeri et figurae, nec est possibile ut intendatur vel remittatur; sed omnis additio vel subtractio facit aliam speciem.

Et ideo aliter dicendum, secundum Philosophum in I *De generatione,* quod formae miscibilium non manent in mixto actu, sed virtute; prout scilicet virtus formae substantialis manet in qualitate elementari, licet remissa, et quasi ad medium redacta: qualitas enim elementaris agit in virtute formae substantialis; alioquin actio quae est per calorem ignis, non terminaretur ad formam substantialem. Cf. Aquinas, *Quaestiones disputatae,* vol. II, disp. IV, *De Anima,* q. 9, ad 10 (Turin, 1942), p. 410.

[14] Aristotle, *Praedicamenta,* vol. I, c. 5, 3b 24, 33.

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accidental forms, they can admit of more or less, even though they are related to one another as contraries.

7. Now this position is improbable for many reasons.

8. First, because it is altogether impossible for something to stand midway between substance and accident, for then there would be a mean between affirmation and negation. For it is the nature of an accident that it be in a subject but it is the nature of a substance that it be not in a subject. Now substantial forms are indeed in matter, but not in a subject; for a subject is something individual. Now a substantial form is that which causes the individual subject. It does not, on the contrary, presuppose it.

9. Likewise, it is ridiculous to say that there is something midway between things which do not belong to the same class; for the mean and the extremes must belong to the same class, as is proved in the tenth book of the *Metaphysics*.[15] Therefore there can be no mean between substance and accident.

10. Furthermore, it is impossible for the substantial forms of the elements to admit of more or less. For every form that admits of more or less is accidentally divisible inasmuch as the subject can participate in it more or less. Now we find continuous motion in that which is divisible essentially or accidentally, as is made evident in the sixth book of the *Physics*.[16] We have as examples change of place, and growth and decay with respect to space and quantity which are essentially divisible, and alteration with respect to qualities, such as hot and white, that admit of more or less. If then the forms of the elements admit of more or less, there will be continuous motion in both the generation and the corruption of the elements. But this is impossible. For continuous motion exists only in three genera, namely quantity, quality, and place, as is proved in the fifth book of the *Physics*.[17]

11. Furthermore, every difference in substantial form results in a change of species. Now what admits of more or less differs from that which is less, and is in some way contrary to it, as in the case of the more white and the less white. If then the substantial form of fire admits of more or less, it will result in a change of species according as it is more or less realized, and it will not be the same form but another one. Hence the Philosopher says in the eighth book of the *Metaphysics*[18] that just as the species is changed in the case of numbers by addition and subtraction, so also is it changed in the case of substances.

12. Therefore some other explanation must be found by which the truth that a combination is effected and that the elements are not wholly destroyed but remain in some way in the compound may be safeguarded.

13. Let us consider then that the active and passive qualities of the elements are related to one another as contraries, and admit of more or less. From these contrary qualities which admit of more or less there can be formed a mediant quality which partakes of the nature of each extreme as does grey which lies between white and black and as does warm which lies between hot and cold.

[15] Aristotle, *Metaphysics,* vol. II, lib. X, c. 7, 1057a 20.

[16] Aristotle, *Physics,* vol. I, lib. VI, c. 1, 231b 15; c. 2, 233b 15.

[17] *Ibid.,* vol. I, lib. V, c. 1, 225b 9; cf. c. 2, 226a 23–b 8.

[18] Aristotle, *Metaphysics,* vol. II, lib. VIII, c. 3, 1043b 36–1044a 2.

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Thus, when the perfections of the qualities of the elements are modified,[19] there is formed from them some kind of mediant quality which is the quality characteristic of the compound and which differs in different compounds according to the different proportions of the combinations; and this quality is, in fact, the disposition[20] that belongs to the form of the compound,[21] just as the elementary quality is the disposition that belongs to the form of an element. Therefore, just as extremes are united in the mean which participates in the nature of both, so the qualities of elements are united in the quality that is characteristic of the compound. The quality, however, of an element is indeed distinct from its substantial form; however, it acts by virtue of the substantial form; otherwise, heat would merely warm, and not by its power would a substantial form be brought to actual existence; for a thing's activity cannot transcend its nature.

14. In this way then the powers of the substantial forms of the elements are retained in compounds. Therefore the forms of the elements are present in compounds not actually but virtually;[22] and this is what the Philosopher says in the first book of the *De generatione et corruptione*.[23] "The elements do not remain actually in the compound, as body and white do, and neither one of them nor both of them are destroyed or altered; for their power is preserved."

[19] Aquinas, *In meta.*, lib. I, lect. 12, par. 195, p. 67: Non quodlibet natum est misceri cuilibet in corporibus; sed illa sola nata sunt adinvicem misceri, quae nata sunt adinvicem transire per aliquam alterationem, eo quod mixtio est miscibilium alteratorum unio.

[20] Cf. *Sum. theol.*, vol. I, Pars I, q. 76, art. 4, ad 4, p. 457a: Et huiusmodi qualitas mixtionis est propria dispositio ad formam substantialem corporis mixti, puta formam lapidis, vel animae cuiuscumque.

[21] *Contra gentiles*, lib. IV, c. 81, p. 547: Forma mixti dupliciter accipi potest. Uno modo ut per formam mixti intelligatur forma substantialis corporis mixti. . . . Alio modo dicitur forma mixti qualitas quaedam composita et contemperata ex mixtione simplicium qualitatum, quae ita se habet ad formam substantialem corporis mixti, sicut se habet qualitas simplex ad formam substantialem corporis simplicis.

[22] Aquinas, *Contra impugnantes Dei cultum et religionem*, c. XII: Dicendum, quod quando aliquid totaliter transit in alterum, non dicitur esse mixtio; sed quando est mixtio, utrumque miscibilium convertitur in unum tertium. (*Opuscula omnia*, vol. IV [Paris, 1927], p. 146). Cf. also *Sum. theol.*, vol. IV, Pars III, q. 77, art. 8, c, p. 2968b: Quod autem est commixtum ex duobus, neutrum miscibilium est, sed utrumque transit in quoddam tertium ex his compositum. *Contra gentiles*, lib. IV, c. 35, p. 489: Dato quod fieret mixtio, neutra natura remaneret salvata: miscibilia enim in mixto non salvantur, si sit vera mixtio. *ibid.*, lib. II, c. 56, p. 150: Quae miscentur, mixtione eam facta, non manent actu, sed virtute tantum: nam si actu manerent, non esset mixtio, sed confusio tantum; unde corpus mixtum ex elementis nullum eorum est. *Sum. theol.*, vol. I, pars I, q. 76, art. 4, ad 4, p. 457a: Dicendum est, secundum Philosophum in I *De gener.* quod formae elementorum manent in mixto non actu, sed virtute. Manent enim qualitates propriae elementorum licet remissae, in quibus est virtus formarum elementarium. Cf. *In libros Aristotelis de caelo et mundo expositio*, lib. III, lect. VIII: Si enim generatio et corruptio corporum fit per congregationem et segregationem, sicut Empedocles et Anaxagoras posuerunt, consequens est quod elementa sint actu in mixto. Si autem generatio et corruptio corporum est per alterationem, necesse est dicere quod elementa sint potentia in mixto. (*Opera omnia*, vol. III, p. 256.) *Sum. theol.*, vol. IV, pars III, q. 66, art. 4, obj. 3, p. 2856a: In corpore mixto . . . non sunt elementa in actu. Cf. *In meta.*, lib. I, lect. 12. par. 196, p. 67: Mixtum non habet actu aliquid eorum quae in eius mixtionem conveniunt, sed potentia tantum . . . Miscibilia, etsi sint in potentia in mixto, tamen non sunt in eo in potentia pure passiva. Manent enim virtute in mixto. Quod ex hoc potest patere, quia mixtum habet motum et operationes ex virtute corporum miscibilium. . . . Mixtum etsi non sit actu aliquod miscibilium, est tamen aliquid actu . . .

[23] Aristotle, *De generatione et corruptione*, vol. I, lib. I, c. 10, 327b 29–31.

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